CONFIDENTIAL

25X1

7 May 1954

MEMORANDUM FOR THE RECORD

SUBJECT: Project Monitor at [redacted] 25X1
[redacted], on P-101A, Communication System, 25X1
Infrared

1. **Time and Place of Meeting:** The meeting was held on 6 May 1954 at [redacted] 25X1

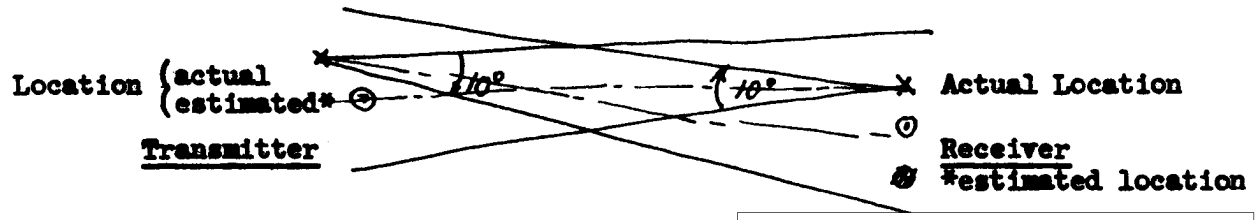
2. **Attendance:** [redacted] 25X1

3. **Purpose of Discussion:** The purpose of the discussion was to review past progress on P-101A and to determine the course of future work.

4. **Discussion and Conclusions:**

a. **Beamwidth Studies:**

(1) [redacted] has made several experimental studies in their dark tunnel using two simulated transceivers. These studies showed that when using a 5° transmitter beamwidth and a 1/3° receiver acceptance angle, it is possible to achieve alignment in 12-14 minutes. The method used is as follows. The transmitter and receiver location angular errors are assumed to be ±5° in elevation and azimuth from the estimated location. 25X1



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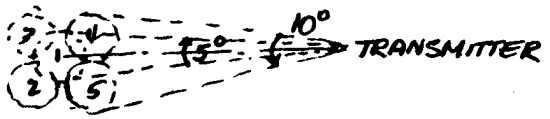
The transmitter is made to cover the 10° cone of uncertainty wherein the receiver is located in 5 positions as in the diagram below. The transmitter beam is audio modulated and is allowed to remain in each



position 2 minutes. The receiver is swept manually through a search pattern in the 10° cone of uncertainty wherein the transmitter is located. This search pattern is repeated once every 2 minutes or until the transmitter is located. The receiver goes to transmit as soon as the contact is made. The transmitter goes on receive after 10 minutes and executes a receiver search pattern lasting 2 minutes or less. During the execution of this search pattern, alignment will be completed.

(2) In the equipment used for this test the transmitter is provided with graduated scales showing the angular position of the beam in elevation and azimuth. The 5 positions are set by hand with reference to these scales. The receiver has a screw elevation adjustment and 10° azimuth stops. A 10° azimuth sweep is made manually, followed by a half turn of the elevation screw (equivalent to 1/3°) and then another azimuth sweep, etc.

(3) Several difficulties were found in this equipment and method by the APD representatives. First, the audio amplifiers used with the equipment picked up so much noise from the motor driven choppers used for modulating the transmitter beams that the signal to noise ratio was very low. It was easily possible to scan with the receiver through the edge of the transmitter beam and lose the signal completely in the noise. Second, the concentration required on the part of the operator throughout the alignment procedure makes it unlikely that contact would be made if either operator were scared, excited, or worried about failure to make contact. Third, the use of a transmitter beamwidth of as great as 5° is undesirable during communications and alignment both from the viewpoint of security and the power required for a given range. Fourth, there is some doubt whether it is necessary to scan as large a cone as 10°. It is likely, for example, that as little as 3° error in elevation will be made by the operators of this equipment in the field.

(4) It was concluded that improvement would have to be made in the above system. One of the first points to be determined is the error to be expected in the estimated angular locations of the stations when the operators are given map locations of the stations plus Army compasses. [redacted] will run some field experiments to determine this error under practical conditions. The result of these field tests will be used to improve the present system or to devise some better system. 25X1

b. Power Source

b. Power Source Studies: [redacted] is still considering the use of a liquid fuel engine driven generator unit. Presently, work is being done to assemble the unsilenced generator, the small engine, the flywheel, the coupling, and the generator itself. The flywheel and other hardware are being constructed by [redacted]. The engines are on hand while generators have been on order for 30 days. The complete package will be presented to [redacted] for a bid on the silencing problem. 25X1 25X1 25X1

c. Light Source - Modulator Studies: The xenon arc source, previously eliminated on the basis of the fact that it could not be restarted while hot, is being reconsidered. New data has been received which indicates that the arc may be started while hot after only several seconds delay.

(1) Investigation is being made of galvanometer movements to be used in a mechanical modulation scheme. No definite optical modulation arrangements have been formulated.

d. Personnel:

(1) The project engineer recently assigned to this project, [redacted] appears to be a very capable man with a great deal of initiative. A noticeable change in attitude is noticeable after only two weeks of his being on the project. 25X1

(2) Presently, sufficient cleared personnel are available for work on the project.

5. Actions;

a. APD: APD will determine what common liquid fuels such as gasoline, kerosene, alcohol, etc. are available in the localities where the IR communication system will be used. Available battery and power line supplies are also of interest.

b. [redacted] will attempt to determine by field experiments the angular error to be expected in the location of the two transceiver stations when using map locations and compasses. 25X1

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APD/TSS

AST:mmw

Distribution
P-101A - Orig.
1 - Chrono